Cheng et al. Large Database Search Using CAM and Hash

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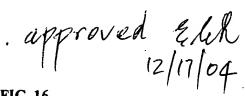


FIG. 16

V.							
0)	Hash-based approach (2-way-set-associative)	CAM-based appr ach	H-CAM-based appr ach (2-way-set-associative)				
	Fig. 1	Fig. 2	Fig. 8				
ASIC output pins	21	128	128				
ASIC input pins	160	32	32				
RAM size (est. cost)	2M x 160 (\$800)	1M x 32 (\$80)	1M x 32 (\$80)				
CAM size (est. cost)		1M x 128 (\$3200)	100K x 128 (\$320)				
Hash Pointer RAM size (est. cost)	•	•	2M x 20 (\$100)				
Search Data RAM size (est. cost)	-	-	1M x 128 (\$320)				
Database size (entries) supported	Depends	1M	Depends				
Associate content RAM read	2 reads per search	1 read per search	1 read per search				
Estimated cost	\$800	\$3280	DESCRIPTION				
Estimated Power consumption	20W	162W	128.5				

Table 1

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	Search value (6-digit wide)	Hash 1 output (4-digit wide)	Hash 2 output (2-digit wide)	CAM 1 content	CAM 2 content	Memory content
1	-	-	-	<u> </u>	•	-
2	324238	7783	63	-	•	
3	-	•	-	•	-	63: 324238,17
4	578901	6311	63	•	-	63: 324238,17
5	-	-	*	-	100:6311	63: 324238,17 100: 578901,23
6	322413	6311	63	-	100:6311	63: 324238,17 100: 578901,23
7	-	-	•	200:322413	100:6311	63: 324238,17 100: 578901,23 200: - , 86
8	578901	6311	63	200:322413	100:6311	63: 324238,17 100: 578901,23 200: - , 86
9	322413	6311	63	200:322413	100:6311	63: 324238,17 100: 578901,23 200: - , 86
10	324238	7783	63	200:322413	100:6311	63: 324238,17 100: 578901,23 200: - , 86

## Table 2

Memory Size and	Bandwidth requirement	Old method (Fig. 1)	H-CAM (Fig. 11)
Memory size	Search Data memory	8 million entries	1 million entries
	Hash Pointer memory	none ,	2M pointers
	Total (Mbit)	1024	164
Memory bandwidth	Reads/search	8	2 per H-CAM

Table 3